

**REMARKS**

Claims 2-4, 10, 13, 14, and 22-40 are canceled without prejudice. Claims 1, 6-9, 12, 41 and 42 have been amended. Accordingly, claims 1, 5-9, 11, 12, 15-21, and 41-21 are currently pending in this application.

Claim 41 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Since claim 41 has been rewritten in independent form to include all limitations of the base claim, withdrawal of this objection is respectfully requested.

Claims 1, 4-9 and 11-14 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. In light of the amendments herein, this rejection is moot. Applicant, however, submits that the disclosure does adequately describe the term “solely” with respect to “said at least one semiconductor die being secured at its bottom surface to said top surface of said support structure solely by a flowable adhesive material.” Specifically, Applicants direct the Examiner’s attention to Figures 5 and 6.

Claim 14 stands rejected under 35 U.S.C. § 112, first paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In light of the amendments herein, this rejection is moot.

Claims 1, 6, 7, 12-14, and 42 stand rejected under 35 U.S.C. § 102 as being anticipated by Cognetti et al., U.S. Patent No. 5,489,752 (“Cognetti”). This rejection is respectfully traversed.

The claimed invention relates to a semiconductor assembly. As such, amended independent claim 1 recites a “semiconductor assembly” comprising, *inter alia*, “a first semiconductor die with a top and bottom surface” and “at least one second semiconductor die having a perimeter, including four sides, and a top and bottom surface, said bottom surface having a smaller area than said top surface of said first semiconductor die.”

Amended independent claim 1 further recites “an encapsulating material for encapsulating said at least one second semiconductor die, electrical communication, and at least a portion of said first semiconductor die, said encapsulating material filling a space between said bottom surface of said at least one second semiconductor die and said top surface of said first semiconductor die.”

Similarly, amended independent claim 42 recites a “semiconductor assembly” comprising, *inter alia*, “a support structure having a top surface,” “at least one semiconductor die having a perimeter, including four sides, and a top and bottom surface, said bottom surface having a smaller area than said top surface of said support structure,” and “at least a second semiconductor die having a perimeter, including four sides, and a top and bottom surface, said bottom surface having a smaller area than said top surface of said first semiconductor die.” Amended claim 42 also recites “said second semiconductor die being secured at its bottom surface to said top surface of said first semiconductor die by a compressed flowable adhesive material which does not extend past any one of the sides of said perimeter of said second semiconductor die such that there is a second cavity along at least a portion of said perimeter between said first semiconductor die and said second semiconductor die, said second cavity being filled with said encapsulating material.”

Cognetti fails to disclose all elements of any of amended independent claims 1 and 42. Cognetti relates to a method for dissipating heat from an integrated circuit mounted on a circuit board. Cognetti is abstract. Cognetti is silent about a second semiconductor die secured at its bottom surface to a top surface of a first semiconductor die, as recited by amended independent claims 1 and 42. Instead, Cognetti teaches an integrated circuit package 20 attached to a circuit board 10. Cognetti at col. 2, lines 36-37.

Additionally, Cognetti fails to disclose “an encapsulating material for encapsulating said at least one second semiconductor die, electrical communication, and at least a portion of said first semiconductor die, said encapsulating material filling a space

between said bottom surface of said at least one second semiconductor die and said top surface of said first semiconductor die,” as recited by amended independent claim 1; nor “a second cavity along at least a portion of said perimeter between said first semiconductor die and said second semiconductor die, said second cavity being filled with said encapsulating material,” as recited by amended independent claim 42. For at least there reasons, withdrawal of this rejection is respectfully requested.

Claims 8 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Cognetti in view of McMahon, U.S. Patent No. 6,075,712 (“McMahon”). This rejection is respectfully traversed.

As discussed above, Cognetti fails to disclose, teach or suggest all limitations of amended independent claim 1. McMahon relates to “a flip-chip having bond pads on the backside of the chip that are electrically coupled to active devices in the chip.” McMahon at col. 1, lines 7-10. McMahon teaches an assembly including a chip that is coupled to a package substrate through a conductor region on a front surface of the chip. The conductor region has contact pads which are coupled to the package substrate by solder bonds. McMahon at col. 4, lines 35-38. Accordingly, McMahon does not supplement the deficiencies of Cognetti. For at least these reasons, withdrawal of this rejection is respectfully requested.

Additionally, the teachings of McMahon cited by the Examiner are not relevant to claims 8 and 9. The Examiner states that McMahon teaches that a distance between an electrical contact area and a perimeter of a semiconductor die is less than or equal to about 200 microns because McMahon’s Fig. 5A shows an electrical contact area under or within a perimeter a semiconductor die. Office Action at 7. Claim 1, however, recites a “first semiconductor die having at least one electrical contact area at a distance outside said perimeter of said at least one second semiconductor die.” (emphasis added).

Claims 15-17 and 19-21 stand rejected under 35 U.S.C. § 103 as being unpatentable over McMahon in view of Matsumura, U.S. Patent No. 6,534,874 (“Matsumura”). This rejection is respectfully traversed.

As amended, independent claim 15 recites a “semiconductor assembly” comprising, *inter alia*, “a first semiconductor die having a top and a bottom surface,” and “a second semiconductor die having a perimeter, including four sides, and a top and bottom surface, . . . said second die being secured at its bottom surface to said top surface of said first semiconductor die by a flowable adhesive material which does not extend past any one of the sides of said perimeter of said second semiconductor die such that there is a cavity along at least a portion of said perimeter between said first semiconductor die and said second semiconductor die.” Amended independent claim 15 further recites “said top surface of said first semiconductor die has at least one electrical contact area positioned at a location exterior to said perimeter of said second semiconductor die, said second semiconductor die being in electrical communication with said electrical contact area” and “an encapsulating material for encapsulating said at least one second semiconductor die, electrical communication, and at least a portion of said first semiconductor die, said encapsulating material filling said cavity.”

Matsumura relates to a semiconductor device having a plurality of stacked chips. According to Matsumura, a first semiconductor chip having inner and outer electrodes is stacked below second and third chips, which each have inner electrodes. Matsumura discloses that the inner electrodes of the second and third chips each have through holes, each of which contains a plated electrode. The chips are stacked such that the inner electrodes and through holes of the second and third chips are connected to the inner electrodes of the first chip by the continuously extending plated electrodes. Matsumura at col. 5, lines 11-65.

Neither McMahon nor Matsumura, even when considered in combination, teach or suggest all limitations of amended independent claim 15. Specifically, both

McMahon and Matsumura are silent about “an encapsulating material for encapsulating said at least one second semiconductor die, electrical communication, and at least a portion of said first semiconductor die, said encapsulating material filling said cavity,” as recited by amended independent claim 15. For at least these reasons, withdrawal of this rejection is respectfully requested.

Additionally, the teachings of McMahon as described by the Examiner are not relevant to amended independent claim 15 for the same reasons discussed above in connection with claims 8 and 9.

Claim 18 stands rejected under 35 U.S.C. § 103 as being unpatentable over McMahon in view of Matsumura, and in further view of Crowley et al., U.S. Patent No. 6,459,147 (“Crowley”). This rejection is respectfully traversed.

As discussed above, neither McMahon nor Matsumura, even when considered in combination, teach or suggest all limitations of amended independent claim 15. For at least these reasons, withdrawal of this rejection is respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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